SCHOOL OF PUBLIC HEALTH

COLLEGE OF MEDICINE AND HEALTH SCIENCES

UNIVERSITY OF GONDAR

ASSESSMENT OF MALARIA DATA QUALITY PRACTICES AND ITS POTENTIAL FACTORS IN NEDJO WOREDA, WEST WELLEGA ZONE,OROMIA REGIONAL STATE ,WEST ETHIOPIA.

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LIST OF ACRONYMS

ACD	Active Case Detection
BSC	Bachelor of Science
CDC	Communicable Disease Control
CMHS	College of Medicine Health Science
DHO	District Health Office
FMOH	Federal Ministry of Health
HC	Health Center
HFs	Health Facilities
HI	Health Institutions
HMIS	Health Management Information System
HP	Health Post
HWs	Health Workers
HEW	Health Extension Worker
ICD	International Classification of Disease
MDGs	Millennium Development Goals
MOP	Malaria Operational Plan
MPH	Master of Public Health
NGOs	Nongovernmental Organizations
ONRS	Oromia National Regional State
OPD	Outpatient Department
PCD	Passive Case Detection
RBs	Registration Books
RHB	Regional Health Bureau
WHO	World Health Organization

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Abstract

Introduction: Data Quality is the state of completeness, consistency, timeliness and accuracy that makes data appropriate for a specific use. Data of poor quality leads to in appropriate planning and inefficient budget allocation. Even though quality data on malarial disease is critical for planning, decision making and assessment of the efficiency and effectiveness of the intervention on malaria control and prevention program, the available data are of poor quality and potential factors that affect data quality are not assessed well.

Objective: The aim of this study was to assess malaria data quality practices and its potential factors in Nedjo woreda, west Wellega zone, Oromia regional state, West Ethiopia, 2012.

Methods: Institution based cross-sectional quantitative study triangulated by qualitative study design was employed. The methods include observation of data management practices, review of existing documents and in-depth interview with key informants. All (49kebeles) in the woreda were clustered in to 5 clusters. Three clusters were randomly selected. All the health posts and all health centers in the selected cluster were included.

Result: The mean percentage of timeliness was 69.7% and completeness was 73.7% compared to the standard set by federal ministry of health (90%). The ratio of recounted to reported data over six months was 0.766 with the mean discrepancy value of 54.5, (23.34%). Problem of forgetting to transfer data from notebook to registration book, lack of independent registration book for malaria, lack of commitment and attention from health professionals to cross check registration book before reporting, data filling by estimation assuming as valueless were among some factors affecting data accuracy as explained by key informants.

Conclusion and Recommendation: Generally the study revealed that malaria reporting system in the woreda is being suffered from poor data quality in terms of timeliness, completeness and accuracy dimensions of data quality. Some statements on report formats which have the same ideas but on different pages need to be modified so that the required information can easily be collected with common understanding. Reporting time also need not overlap with other trainings/meetings.How to reconcile note books and registration books also needs to have attention

1. Introduction

1.1. Statement of the problem

Malaria is one of the most common infectious diseases and a great public health problem worldwide, particularly in Africa and south Asia. About half of the world's population lives in areas where people are at risk(1).In 2010; an estimated 3.3 billion people were at risk of malaria. There were 216 million cases of malaria and an estimated 655 000 deaths of which 91% were in Africa. Most deaths occur among children living in Africa where a child dies every minute of malaria and the disease accounts for approximately 22% of all childhood deaths. Approximately 86% of malaria deaths were of children under 5 years globally where as at least 20% of childhood deaths in Sub-Saharan Africa countries. In addition to this there is an estimated decrease in economic growth due to malaria in highly endemic countries; greater than one percent point(2, 3).

In Ethiopia, malaria accounts for up to 12% of OPD cases and 10% of admissions. About 75% of the country has malaria transmission (defined as areas less than2, 000 m), with about 68% (i.e. 50 million) of the country's total population living in areas at risk of malaria. The FMOH estimates that there are 5 – 10 million clinical malaria cases of which 245,499 (18%) being confirmed cases and approximately 70,000 people die of malaria each year (4).

In Oromia malaria is also considered to be the most important communicable disease. More than three quarters of the state, i.e. 262 of 297 (88%) districts and 4,237 of 6,765 (63%) municipalities, are considered to have malaria transmission, accounting for over 17 million persons at risk of infection. There are an estimated 1.5 to 2 million clinical cases per year, accounting for 20-35% of OPD cases, 16% of admissions, and 18-30% of hospital deaths(4).

Data quality is a basic requirement for disease control and prevention program. If data is inaccurate, incomplete, and not timely obtained, it leads to either overestimation or underestimation of disease burden, distribution, and trends which finally results in difficulty of decision making and improper planning for intervention.

A study conducted in one district of Kenya showed that information produced by district health management information system was 26% timely, 19%complete and 30% accurate. Also study conducted in Solomon Islands indicated that the data which were being reported from clinics to government statics is in accurate and average monthly data discrepancy was big with 21.2% which shows one fifth of the cases were over reported when nurses reported the cases to the government statistics.(5, 6).Even though Quality data on malarial disease is critical for the planning of malaria control as well as assessment of the efficiency and effectiveness of the intervention, the available data are of poor quality and there are few researches conducted to assess data quality and to explore potential factors to data quality.

1.2 Literature Review

1.2.1 Burden of the disease

Malaria is one of the most common infectious diseases and a great public health problem worldwide, particularly in Africa and south Asia. About half of the world's population lives in areas where people are at risk(1). An estimated 3.3 billion people were at risk of malaria in 2010.Of this total 2.1billion were at low risk (<1case per 1000 population), 94% of whom were living in geographic regions other than Africa. The 1.2 billion at high risk (>1 case per 1000 population) were living mostly in Africa (47%) and south East Asia region (37%).Also there were 216 million cases of malaria and an estimated 655 000 deaths of which 91% were in Africa. In addition to this there were an estimated 655,000 malaria deaths of which 91% were in Africa and about 86%of malaria deaths were of children under 5 years of age(2).

In sub-Saharan Africa (SSA), there were 91% of all malaria-related deaths and it is estimated to result in an annual loss of 35.4 million Disability Adjusted Life Years .Also 85% of the deaths amongst children below five years of age and 40% of all public health Spending is related to malaria(7).

Malaria is the leading communicable disease in Ethiopia. About 75% of the country has malaria transmission (defined as areas <2,000 m), with about 68% (i.e. 50 million) of the country's total population living in areas at risk of malaria. It accounts for about 30% of the overall Disability Adjusted Life Years lost, 12% of reported outpatient visits and nearly 10% of admissions. There are an estimated 5 – 10 million clinical malaria cases and 70,000 people die of malaria each year in Ethiopia (4).

In Oromia malaria is also considered to be the most important communicable disease. More than three quarters of the state, i.e. 262 of 297 (88%) districts and 4,237 of 6,765 (63%) municipalities, are considered to have malaria transmission, accounting for over 17 million persons at risk of infection. There are an estimated 1.5 to 2 million clinical cases per year, with malaria accounting for 20-35% of outpatient consultations, 16% of health facility admissions, and 18-30% of hospital deaths(4).

1.2.2. History and current status of malaria control in Ethiopia.

In 1959, the Malaria Eradication Service was established with funding support by USAID. Ethiopia, along with Zimbabwe and South Africa, were the only three countries in Africa to embark on a malaria eradication effort in line with the Global Malaria Eradication Efforts spearheaded by WHO. In 1976, as in many other countries, the country shifted from an 'eradication' program to a 'control' program known as the National Organization for the Control of Malaria and Other Vector-Borne Diseases. Until the early 1990's, malaria control was organized by *sectors*, with a sector covering about two to five districts or 75,000 to 150,000 people(8).

Starting in 1993, a major reorganization and decentralization occurred within the FMOH, and the former vertical program was dismantled. The Regional States took over responsibility for many aspects of the program, and malaria control (including vector control) was integrated with other parts of the health system. In a subsequent FMOH reorganization, malaria control became a 'team' (i.e. the Malaria and Other Vector-Borne Disease Team) under the FMOH's Disease Prevention and Control Department, rather than a separate department (8).

From 2001 – 2005 the FMOH developed the first strategic plan having objective to reduce the overall burden of malaria (morbidity and mortality) by 25% by the end of the year 2005 as compared to the year 2000 levels, and to maintain malaria free areas through strong surveillance and preventive measures(9).

FMOH also had the second strategic plan from 2006-2010 to fight malaria developing important strategies. The strategies include access to effective and affordable treatment for malaria, improving coverage of all households in ITNs targeted districts with at least two ITNs per household improving coverage of villages targeted for Indoor Residual Spraying (IRS), Early detection and treatment for the disease and to strengthen malaria surveillance in malaria free areas for timely understanding of the situation and to institute timely preventive measures Malaria remains as the major causes of morbidity as well as mortality in the country.The RBM baseline survey indicated that only 31% of

cases of fever seen in health facilities were properly managed only 7 % of children with malaria received early diagnosis and treatment and the case fatality rate was 5.2%. Infant and under five mortality are 97/1000 and 140/1000 respectively(9).

1.2.3 Data quality

Quality data is critical to assessing the global burden of disease and developing public health initiatives. We live in an era of unprecedented technological advancement, which has provided us with increased access to data. However , just because data has become more available does not mean that all data is accurate and reliable (10).

The health information system (HIS) is a key component of control programs and its accuracy is necessary for the assessment of disease risks, the formulation of priorities and the evaluation of the cost-effectiveness of different interventions. As study conducted in Vietnam shows In order to assess the quality of the HIS in estimating malaria morbidity, data obtained by active (ACD) and passive case detection (PCD) were routinely collected from health centers and compared. The majority of malaria cases (80-95%) detected by ACD were missed by the HIS. Similarly, most malaria cases (50-90%) detected by PCD were also missed by the HIS. The current HIS greatly underestimates the malaria burden although malaria has sharply decreased in the country over the past few years. (11).

Due to incompleteness of reports, reported cases can be under estimated and this may lead to in appropriate performance evaluation and low emphasize to intervention towards prevention and control of the disease. As a study conducted in Netherlands to estimate the completeness of notification of malaria cases by physicians, completeness of notification by physicians was 40.2 % and 69.1% for the laboratories.This implies that many cases may go unreported (12).

As study conducted in Solomon Islands indicates that the data which were being reported from clinics to government statics is in accurate. The average monthly data discrepancy was big with 21.2% which shows one fifth of the cases were over reported when nurses reported the cases to the government statistics(6).

Public decision makers require timely information for timely planning and intervention towards prevention and control of the disease for that report delayed is report denied. Study conducted in Mozambique shows that 87.5% Monthly reports were received timely from health facilities in first week of every month according to the program policy whereas in rest of health facilities (12.5%) reports were received against the program policy. The entries in reports at the time of submission were verified from recording registers in only 75% of the health facilities. Feed back on the monthly reports from health facility staff was received regularly by 70% health workers. Based on scoring system, only 47.5% of monthly reports were categorized as accurate(13).

The report forms include variables that are essential in calculating most of the relevant malaria indicators which are in turn very crucial for appropriate decision making. A study conducted in Mozambique shows huge discrepancy between laboratories confirmed cases reported on the forms and positive tests counted in the laboratory register book. In general the cases reported by far outnumber the tests registered in the laboratory and show unusual variations. One health centre had reported 2721 confirmed cases, while only 255 positive malaria tests were counted in the laboratory register (14).

Similar study conducted in Mozambique showed a significant discrepancy of 62% for cases and 48% for deaths reported comparing inpatients malaria cases and deaths of adults' categories in paper format at a district level with the digital data at the provincial level. (14). A study conducted in Madhya Pradesh (Central India**)** also shows despite the higher burden, reported malaria cases declined much faster in the districts than the aggregated data at state level. However, the aggregated state level data do not tell the correct trend as it would be expected in a site-by-site review of reported district level data(15).

A study conducted in Tanzania shows that Monthly supervision visits highlighted incomplete recording of information between OPD and laboratory records, where on average 40% of laboratory visits were missing the record of their corresponding OPD visit. (16).

Clinical and epidemiologic surveillance of malaria cases and deaths is required to follow the progress of the reinvigorated malaria control programs nationally and internationally.

The result obtained from American journal of tropical Medicine and Hygiene showed that the recording, transmittal, analysis, feedback, and use of malaria surveillance information are delayed and imprecise substantially < 10% of the malaria cases and deaths were being reported. Denominators to compute rates of illness and death require accurate censuses of communities from which patients come to health units and specialized disease and demographic household surveys designed and performed by nationals are needed to complement hospital-based numerator data.(17).

The result obtained from American journal of tropical Medicine and Hygiene also indicted that National disease burdens are often not estimated at all or are estimated using inaccurate methods like representative household surveys and demographic surveillance sites which have their own limitations and it suggested that routinely collected data on confirmed cases of disease would be a more consistent quantification of the population at risk of malaria. However, before routinely collected data can be used to assess trends in the incidence of clinical cases and deaths, the incompleteness of reporting and variation in the utilization of the health system must be taken into account. (18).

Without accurate, timely, and complete information, managers at all level of health system hierarchy are not able to process their day-today operational management properly. A study conducted in one district of Kenya on evaluation of existing district health management information system showed that information produced was 26% timely, 19%complete and 30% accurate(5).

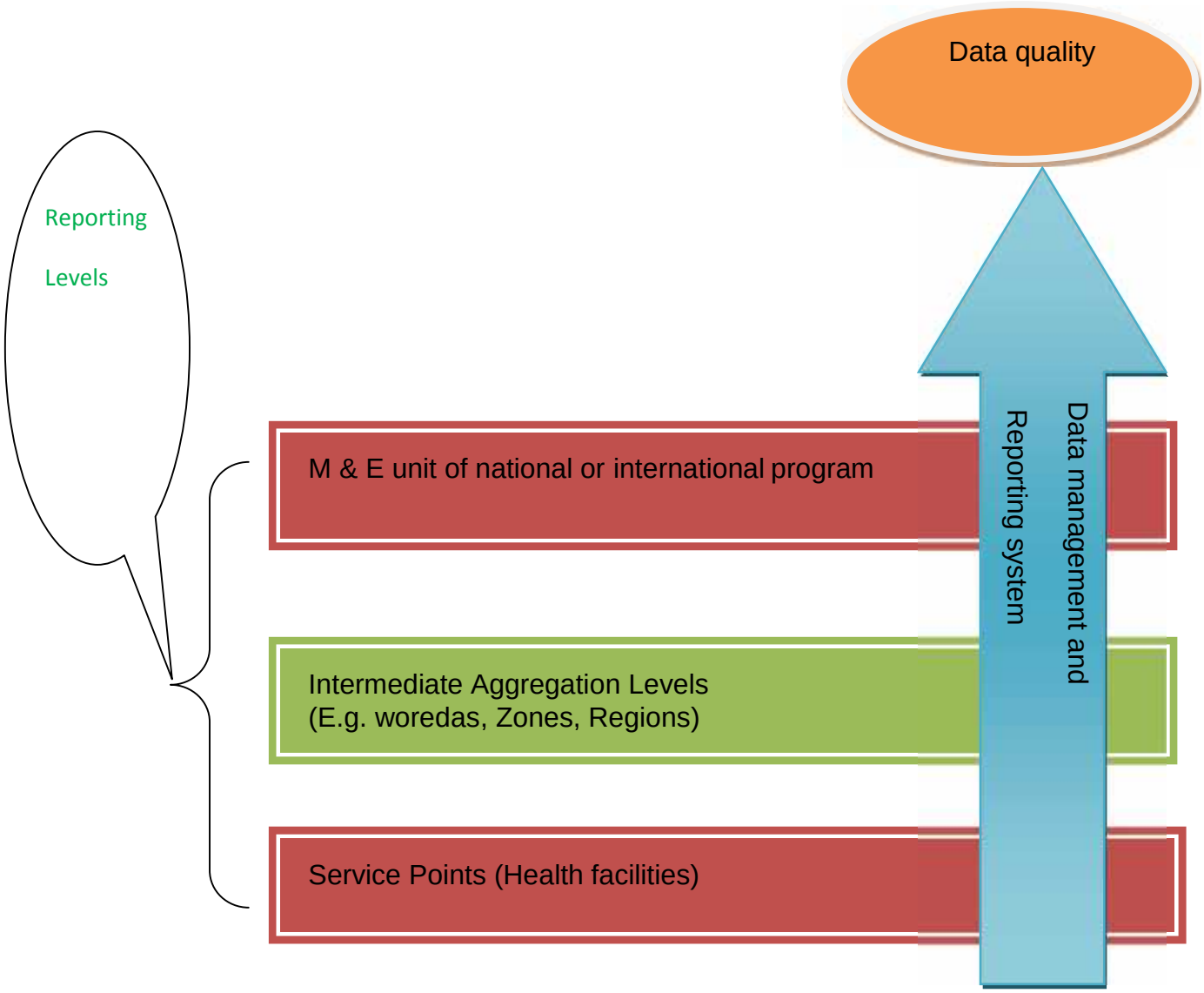


Figure: Conceptual Framework for the Data quality.

1.3 Justifications

Data quality has become very crucial because public health decision makers require data of high quality for good decision making, appropriate planning, resource allocation and improving quality of care. Performance of malaria prevention and control activities cannot be well measured if there is no reliable data on the intervention. Currently, the government has paid great attention towards data quality rather than focusing on provision of the service merely.

Trends and burden of a disease could only be appropriately estimated if there is good data quality on the program. Data of poor quality leads to in appropriate planning and inefficient budget allocation. The issue of data quality problems is also raised frequently on various meetings without common understanding of potential factors that affect quality of data.

Poor data quality fails to contribute to decision making, appropriate planning and resource allocation and finally these results in poor quality health services. As to my knowledge there is no study conducted related to this topic in the study area. Thus, I hope this study will assess what quality of data is being compiled and reported in the woreda and explore potential factors that affect quality of data on malaria control and prevention program.

2. Objective

2.1 General objectives:

- To assess malaria data quality practices and its potential factors in Nedjo woreda west Wellega zone Oromia regional state, West Ethiopia, 2012.

2.2 Specific objectives:

- To verify the timeliness of malaria reporting system practices.
- To verify the completeness of malaria reporting system practices.
- To measure the accuracy of malaria reporting system practices.
- To explore potential factors affecting malaria data quality practices.

3. Methods

3.1. Study design

Institution based cross-sectional quantitative study triangulated by qualitative study design was employed to assess malaria data quality and its potential factors in Nedjo woreda health facilities. The methods include observation of data management practices, review of existing documents and in-depth interview with key informants

3.2. Study area and period.

The study was conducted in Nedjo woreda. Nedjo is found in West wellega zone Oromia regional state. Nedjo is located in the west parts of the region with 515 K.M from Addis Ababa. Nedjo woreda has 49Kebeles. It covers around 958km$^{2.}$ Concerning the population statistics it has a total population of 129,606 with 63,506 males and 66,099 females. In the woreda there are 6 health centers and 49 health posts providing services to the population. Concerning health personnel there are 30 nurses 4 mid wifery Nurse 4 lab technician 5 public nurses 6 druggist and 4 health officers. The study was conducted in the selected health centers and health posts in Nedjo district, west wellega zone,Oromia regional state which is located at 515 Km far from Addis Ababa, towards the west Ethiopia. The study was carried out from April 6 to May 4, 2012.

3.3 Data sources and study population

Data was obtained from the available written malaria data documents related to malaria cases records (registration books and monthly reports) and health professionals working on management of malaria data from July 2011 –December 2012.AllHealth facilities in Nedjo woreda was source population and all health facilities in selected clusters were study population for this study.

3.4 Sample size determination.

All (49kebeles) in the woreda was clustered in to 5 clusters based on their proximity one to another since all kebeles are malarious. Each cluster consists of 10 health posts and their corresponding health centers. For this study, three clusters were randomly selected and all the health posts and health centers in the selected clusters were included.

3.5 Operational definitions

Data Quality: "The state of completeness, consistency, timeliness and accuracy that makes data appropriate for a specific use."

Accuracy: Accurate data are considered correct: it is the ratio of the recounted value of the indicator to the reported value (19).

Completeness: Number of completed reports that are received from reporting institutions during a given time period divided by number reports expected. 90% completeness is a minimum level of acceptability(19, 20).

Timeliness: Number of reports received from reporting institutions according to schedule during a given time period divided by the number of expected.90% timeliness is a minimum level of acceptability (19, 20).

3.6 Data collection methods and tools.

Both qualitative and quantitative data collection methods were used.Data collectors were three diploma graduate nurses and two BSC environmental health professionals. Two BSC nurses were supervisors. Data were collected by reviewing malaria registration books and monthly reports, observation of malaria data management systems and key informants interview. Semi-structured questionnaire and tape recorder were used for interview.

Document review – documents related to malaria in the selected health facilities were assessed. During document analysis, available data in registration book and report formats was collected for comparison of the recounted and reported data and the timeliness, completeness and accuracy of reports was reviewed.

Observation- observation method was also used using check lists at health facilities while actual activities going on. During observation, data recording, daily count of malaria cases, and data collection situation of the health facilities regarding malaria activities were under taken.

Key informant interview

Key informants were selected for interview from health extension workers, laboratory technicians/technologists. Health officers, nurses, head of health centers, malaria focal person, and head of woreda health office and they were interviewed concerning problems related to reporting time, problems related to discrepancy between recounted and reported data, the ease and suitability of report formats, relevant malaria indicators, data quality assurance and etc.

3.7 Data quality assurance

Data was collected by principal investigator and trained health workers in the study kebeles to keep the data quality at optimal level. A pre-test and standardizing of the data collection material was done in different setting from the study area prior to conducting the actual survey. There was daily data checking for their completeness and clarity to give necessary corrections on time.

3.8 Data processing and analysis

After all data were collected, the data were prepared and organized in a manner that is suitable for analysis. Since there were quantitative data to measure the accuracy, completeness, and timeliness of data quality dimensions, their descriptive summaries was analyzed by SPSS version 16 and excel worksheet and result was displayed in the form of graph, table and figure. The qualitative data was analyzed by thematic analysis and result was displayed in the form of text.

3.9 Dissemination of the findings

The results of the investigation will be submitted to the institute of Public health, College of Medicine and Health Sciences, University of Gondar.

The result will be disseminated through publication presentation on annual scientific meeting, conferences, etc.

It will also be disseminated for those who are in need of it such as Oromi regional health Bureau, zonal health department, woreda health offices and various NGOs.

4. Ethical consideration.

Ethical clearance was obtained from the ethical review committee of school of public health, college of medicine and health sciences, University of Gondar. Permission to conduct the study was also obtained from ORHB. Official letter was submitted to West wellega zonal health office and then finally Nedjo woreda health office. During the study, the purposes and various importance of the study were maintained and the confidentiality of study participants were secured at all stages of the study.

5.Results

5.1 Document Review.

In this assessment, timeliness, completeness and accuracy of data quality dimensions and potential factors that affect these data quality dimensions particularly that of malaria prevention and control program has been assessed. Health facilities in Nedjo woreda, 4 health centers and 29 health posts were included in the assessment. Health information system in Nedjo wereda was totally being implemented manually.

In health posts, outpatient morbidity registration books were primary data sources for malaria morbidity while for health centers outpatient, inpatient and laboratory registration books serve as primary data sources on which patients diagnosed for malaria are registered on daily basis. Raw malaria data were collected and entered manually in malaria reporting formats after being categorized by age, sex, diagnosis method (clinical/confirmed), plasmodium species, and pregnancy and death variables.

At health post, malaria data were reported using two reporting formats systems namely the monthly malaria morbidity reporting systems that contain RDT consumption report and weekly integrated disease surveillance system. At health centers level, malaria data were reported using monthly morbidity and mortality reporting format; integrated disease surveillance system and international disease classification codes report. All these three reports used different formats but obtain data from the same source.

Health posts are linked to communicable disease prevention and control team of woreda health office particularly to malaria focal person via Health centers. Data were compiled at health centers and sent to woreda health office. All health facilities in Nedjo woreda stored malaria data on hand paper written formats. Nobody is assigned to coordinate malaria data in health facilities. But, woreda health office has malaria focal person under communicable disease prevention and control team that coordinates activities of malaria reporting. All health centers and health posts have showed their registration books from which routine reports are compiled for monthly malaria morbidity, IDSR and international disease classification codes.

The highest match between recounted and reported data occurred in November, 30.3%(10/33) of all health facilities and the lowest match occurred in august, 12.1%(4/33) of all health facilities .Most of the data reported form health facilities were incompatible with data recounted from registration books.

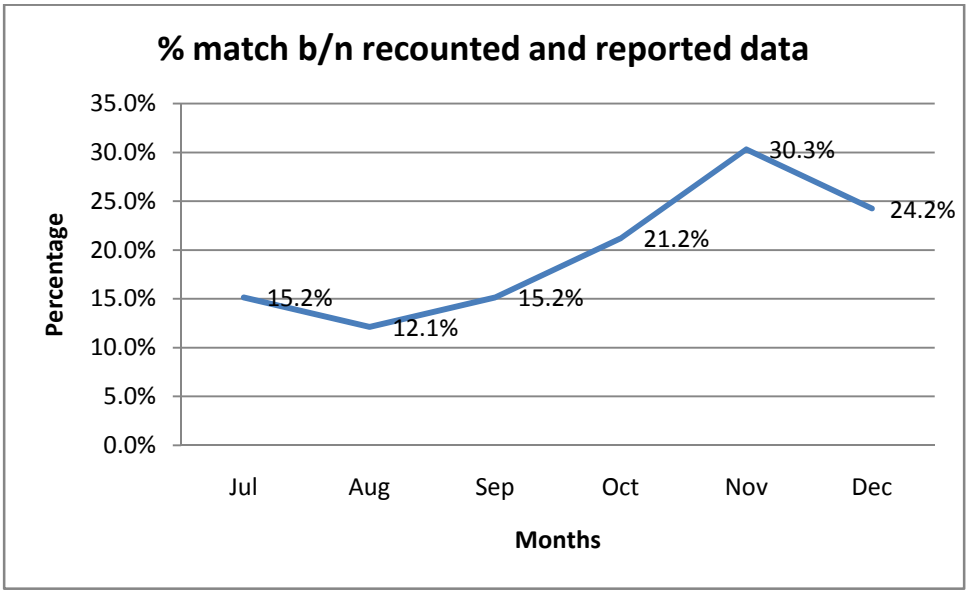


Figure-1: Line diagram showing percentage match between recounted and reported data among all health facilities from July 2011-December 2012, Nedjo woreda west Wollega zone,ONRS,Ethiopia.

The reported malaria data and primary sources (registration books) had differences with the mean discrepancy value of 163 among health centers and the highest discrepancy,202,was occurred in Gori health center.Among health posts, the highest discrepancy between reported and recounted was occurred in Hobora komis health post with value of 127.The highest monthly data discrepancy between recounted and reported data was occurred in September with 27% and the lowest was occurred in October with 16.8%.

The ratio of recounted to reported data over six months period was 0.766 with the mean discrepancy value 54.5, (23.36%).

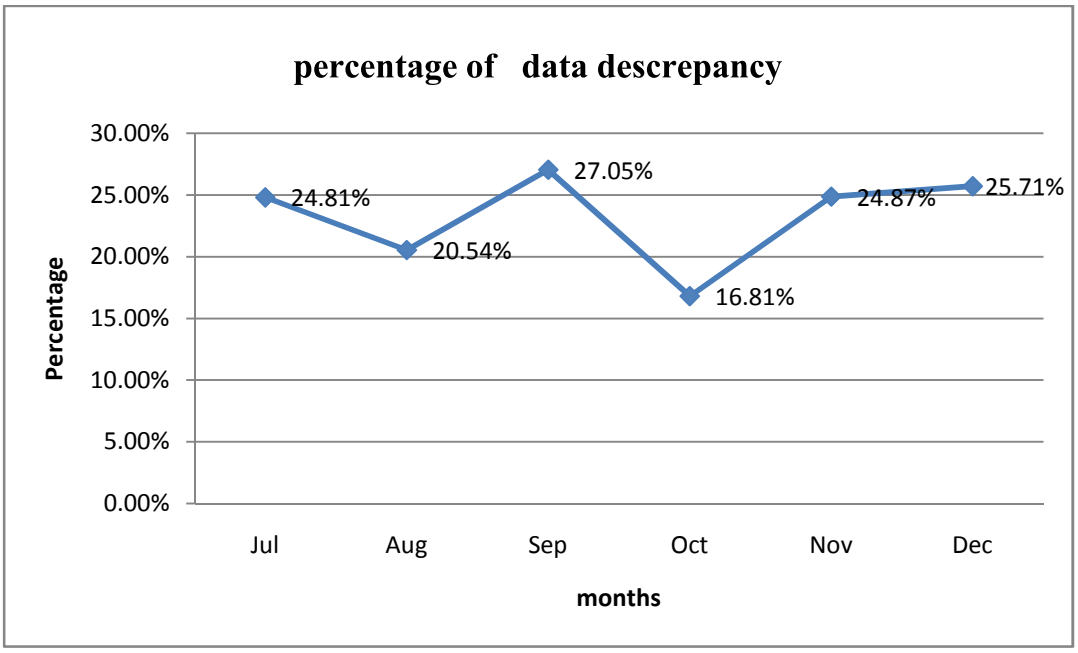


Fig-2: Line diagram showing percentage data discrepancy between recounted and reported data in all health facilities from July 2011-December 2012, Nedjo woreda west Wollega zone, ONRS, Ethiopia.

According to Federal ministry of health, the national standard for both timeliness and completeness is 90% for all reporting levels. Concerning timeliness of report, Since health posts are linked with health centers they are expected to report to health centers from 1^{st}-4^{th} days as the new month begins, health centers are expected to report to woreda health office from 5^{th}-8^{th} days and woreda health office are expected to report to zone health office from 9^{th}-15^{th}days of the next month.

Table-1: Data timeliness in health facilities in Nedjo woreda,west wollega zone,Oromia regional state,July 2011-December 2012.

		Timeliness		
		No	Yes	Total
Jul	No	11	22	33
	% within Months	33.3%	66.7%	100.0%
Aug	No	10	23	33
	% within Months	30.3%	69.7%	100.0%
Sep	No	11	22	33
	% within Months	33.3%	66.7%	100.0%
Oct	No	9	24	33
	% within Months	27.3%	72.7%	100.0%
Nov	No	7	26	33
	% within Months	21.2%	78.8%	100.0%
Dec	No	12	21	33
	% within Months	36.4%	63.6%	100.0%
Total	No	60	138	198
	% of Total	30.3%	69.7%	100.0%

As the result shows, 0ver all timeliness, cumulative timeliness, completeness, and cumulative completeness are below the standard. The highest timeliness percentage was 78.8% and the lowest timeliness percentage was 63.6% which was occurred in November and December respectively.

Table-2: Data completeness in health facilities in Nedjo woreda,west wollega zone,Oromia regional state,July 2011-December 2012.

		Completeness		
		No	Yes	Total
Jul	No	9	24	33
	%within Months	27.3%	72.7%	100.0%
Aug	No	9	24	33
	% within Months	27.3%	72.7%	100.0%
Sep	No	10	23	33
	% within Months	30.3%	69.7%	100.0%
Oct	No	7	26	33
	% within Months	21.2%	78.8%	100.0%
Nov	No	6	27	33
	% within Months	18.2%	81.8%	100.0%
Dec	No	11	22	33
	% within Months	33.3%	66.7%	100.0%
Total	No	52	146	198
	% of Total	26.3%	73.7%	100.0%

The highest completeness percentage was 81.8% which was occurred in November and the lowest completeness percentage was 66.7% which was occurred in December.

The mean timeliness and completeness of all health facilities for the six months period are 69.7% and 73.7% respectively. This implies that out of 198 expected reports from health facilities only 138 were reported timely and 146 were complete during six months period while 178 Reports are expected to be reported being both timely and complete during this period according to FMOH standard.

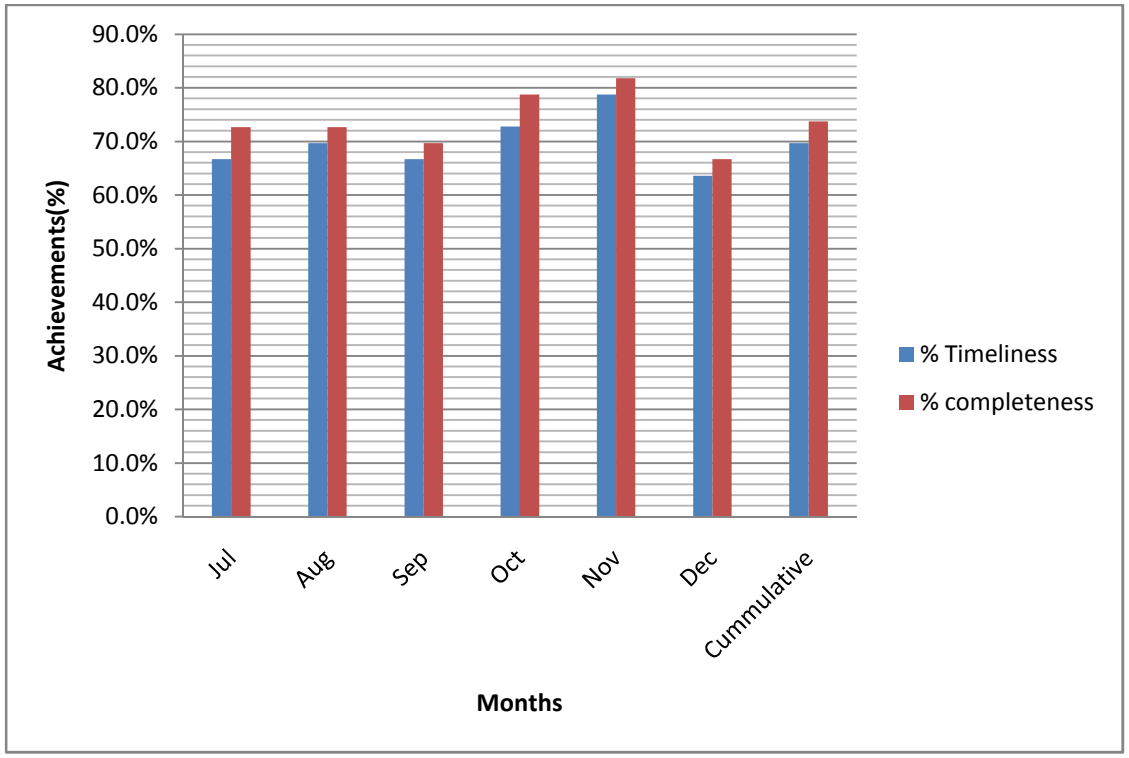
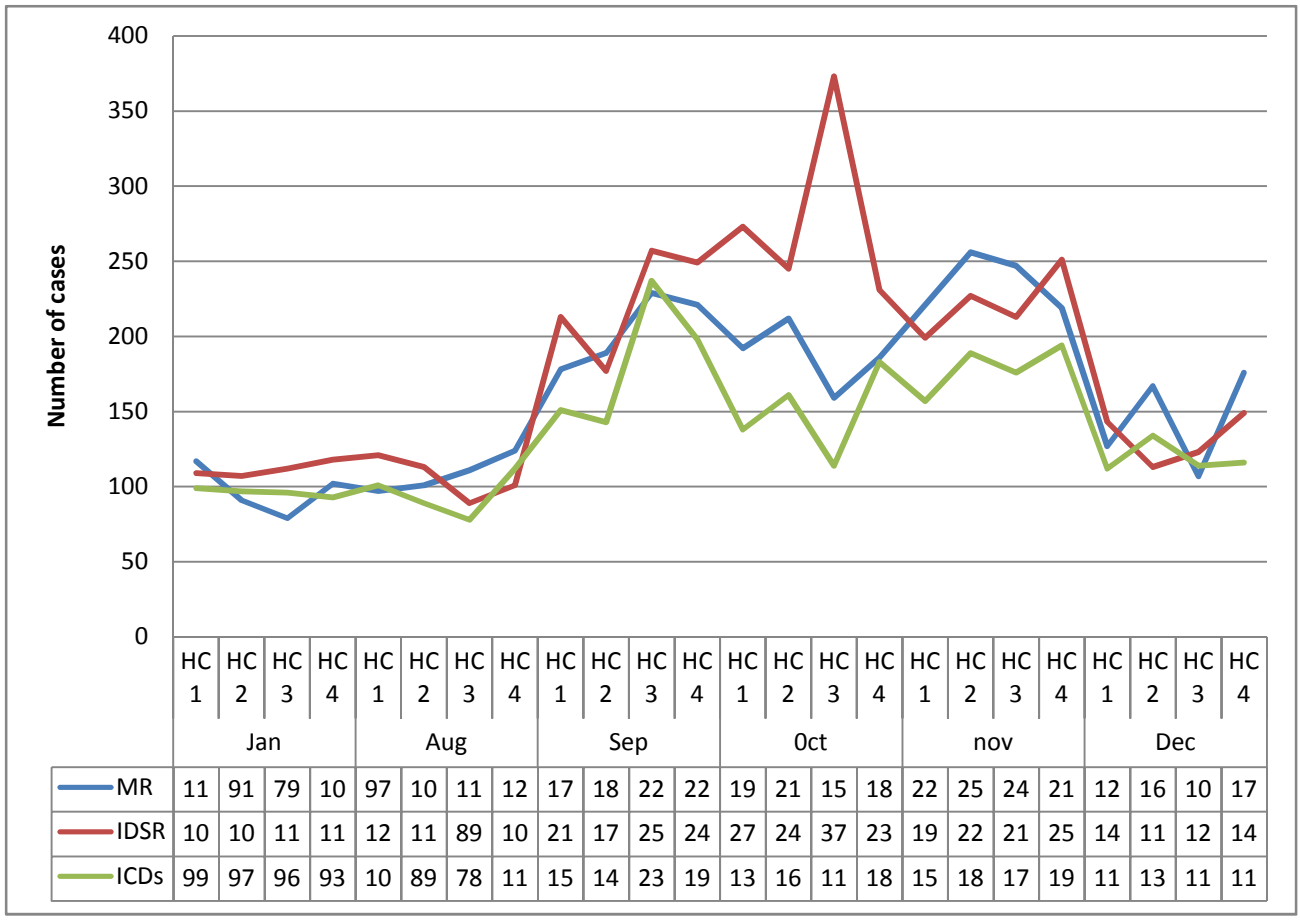


Figure-3: Bar graph showing monthly and cumulative timeliness and completeness of overall health facilities from July 2011-December 2012 in Nedjo woreda health facilities compared with FMOH standard West wollega zone,ONRS.

The study also showed that there was huge data discrepancy among monthly malaria cases reported through different reporting systems from July 2011

December 2012 in Health center -3(Gori Health center)



	HC 1	HC 2	HC 3	HC 4	HC 1	HC 2	HC 3	HC 4	HC 1	HC 2	HC 3	HC 4	HC 1	HC 2	HC 3	HC 4	HC 1	HC 2	HC 3	HC 4	HC 1	HC 2	HC 3	HC 4
	Jan				Aug				Sep				0ct				nov				Dec			
MR	11	91	79	10	97	10	11	12	17	18	22	22	19	21	15	18	22	25	24	21	12	16	10	17
IDSR	10	10	11	11	12	11	89	10	21	17	25	24	27	24	37	23	19	22	21	25	14	11	12	14
ICDs	99	97	96	93	10	89	78	11	15	14	23	19	13	16	11	18	15	18	17	19	11	13	11	11

Fig-4: Line graph showing discrepancy b/n monthly malaria cases reported through three different reporting systems in health centers from July 2011-December 2012, Nedjo woreda,west wollega zone,ONRS,Ethiopia.

5.2 Key informant interview

. A total of 29 key informants were interviewed. These includes 8 health professionals working on OPD and Laboratory,4 heads of health center,15 health extension workers, malaria focal person and head of woreda health office. This supplementary method was used to explore potential factors that affect malaria data quality. 89.7% of the respondents knew the deadline of reporting time but only 69.7% of health facilities report to next level on standard reporting time [fig.3].Among all respondents 82.8% did not know malaria national indicators and measurements used to measure this indicators.

Trainings and Information flow

Training on HMIS procedures were given down up to health center level and none of health extension workers trained on HMIS. Regarding information flow within health facilities and to upper level, the response of respondents clearly showed that there was no discussion on monthly basis at health post level. But it is held at woreda health office level and sometimes at health center level.

Factors

Factors that affect the time reporting were mentioned by the respondents. These were overlapping of training during reporting time, delaying of time to print out and distribute report format for health facilities due to problem of electricity, work overload, lack of commitment of supervisors to collect and compile reports from Health extension workers, distance of health posts from health centers they are linked to. Lack of trainings/orientation on report formats and not being clear with some statements written in the report formats were main factors affected completeness of the report.

Factors that affect data accuracy/that lead to discrepancy between recounted and reported data were described as lack of independent registration book for malaria which results in difficulty to count malaria cases among other diseases easily, problem of forgetting to transfer to registration book what has been recorded on notebook during home visits, lack of commitment and attention from health professionals to re-check

registration book before reporting, Data filling by estimation on reporting formats assuming as valueless, and Being careless in side of health professionals.

Supervision and feedback

Concerning supervision and feedback given from upper level to lower level, the response of most respondents was that nothing was done to cross check what is recorded on registration book and what is reported but the emphasis is only on the monthly performance and how to properly use registration books some times.86.2% of the respondents did not get feedback from upper level regarding data quality even though there was feedback on another issues.

5.3 Observation

In all health facilities in the woreda, health information system is totally being done on paper written formats. As the finding of the assessment showed, there was no clear documentation in written form on health information system. There were also no operational indicator definitions meeting relevant standards that are systematically followed by all service points. The study also revealed out that only very few (36.36%) health facilities recorded their activities with sufficient precision on daily basis. Except in some health facilities the source documents were not kept appropriately during the study time.

There were no adequate provisions of registration books for health facilities. About less than half of health facilities (48.3%) have independent registration books for malaria while (51.7%) use a single registration book for all diseases and this made complex to easily record and collect data on malaria.Even though there is standardized reporting formats distributed by Oromia regional health bureau, data filling in health facilities is different from the expectation of the region. Most of health facilities are not clear to fill out what is actually required on the formats. Collection, aggregation and manipulation of data were poor so that data quality challenges were not addressed.

In health facilities there were no clearly defined and followed procedures to periodically verify source documents against reported data. Even though reporting system of the program is linked to the regional reporting system, the reporting period was not uniformly understood by all health facilities. As observed in one health post malaria cases that are reported on monthly malaria morbidity report are only those which were not reported weekly on IDSR report. But these reporting systems are two different reporting systems even though they use the same data. This situation led to great discrepancy between what is actually on registration books and what is reported.

6. Discussions

As seen from results, the mean timeliness was 69.7%.Though this result is greater than a study conducted in Kenya that showed only 26% timely information produced by existing district health management information system, It is far below the standard timeliness set by FMOH which is 90% and The achievement is also below the Study conducted in Mozambique where 87.5% Monthly reports were received timely from health facilities according to the program policy [5, 13, 20]. Due to the delay of reporting, though more cases are available in specific month, reported cases can be under estimated for the same month and this may lead to in appropriate performance evaluation and low emphasize to intervention towards prevention and control of the disease.

The main factors mentioned by key informants for delay in reporting were: overlapping of training during reporting time, delaying of time to print out and distribute report format for health facilities due to problem of electricity, lack of commitment of personnel assigned as supervisors to collect and compile reports from Health extension workers, distance of health posts from health centers they are linked to.

Regarding problems related to reporting time, one Health extension worker replied: "This health post is far from health center; the person who was assigned as our supervisor may not have commitment to collect and compile our report every month. At this time we send our report via any person we get from any sector those who come to our kebele for another purpose and in middle the report may remain without reaching the upper level on time or even it may be lost." This implies that due to the commitment of supervisors and distance of health posts from health center many reports were not reaching the upper level and finally it led to data not to be obtained in time.

According to this study, the mean data completeness was 73.7% .Though This result is much more than result obtained from study conducted in kenya which is 19% it is still below the anticipated standard (90%) for data completeness which was set by FMOH

[5,20].Due to incompleteness of reports, reported cases could be under estimated. This affects the overall performance. Also it leads to improper planning and misallocation of budget that would enable to control and prevent the disease effectively. The main reasons attempted to be explored for data incompleteness were: being not clear with some statements written in the report formats, work overload and lack of orientation on reporting formats. On the ease and suitability of reporting formats, one health extension worker responded: "it is going to be two years since I was assigned to this health post. Nobody oriented me on reporting format during this time. Even if it is written in Afan Oromo, I am always confused with some statements which have similar ideas but on different pages and I am still confused". These circumstances pave way to data incompleteness.Thus,it is better if similar ideas on the different pages are merged together to one page so that the required information could be easily collected with good understanding.

The other finding of this study was that the ratio of recounted to reported data was 0.766(mean discrepancy 23.34%) which implies excessively reported data. Although this result is lower than study conducted in Mozambique which showed a significant discrepancy of 62%.It is higher than the study conducted in Solomon Islands which indicated 21.2% average monthly data discrepancy [6, 14]. Due to these discrepancies, despite much faster decline in malaria cases, the over reported cases could be misinterpreted as existence of higher burden of the disease. Eventually this results in unnecessarily excess budget allocation which could be allocated for the area which is actually suffering from burden of the disease. Also if there is mismatch between the recounted and reported data, there will no proper planning for the intervention to control and prevent the disease. Thus, the following factors explained as cause of data discrepancy should be combated.

This assessment also attempted to reveal out the main factors that affect data accuracy/that led to discrepancy between recounted and reported data. These were described as lack of independent registration book for malaria which results in difficulty to count malaria cases among other diseases easily, problem of forgetting to transfer

from notebook on to registration book what has been recorded on notebook during home visits, lack of commitment and attention from health professionals to cross check registration book before reporting, data filling by Estimation assuming as valueless, and Being careless in side of health professionals.

The reasons for over reported and under reported data were tried to be assessed and one of health extension workers replied: "our work is not only at health post but also we conduct home visits. During home visits I record each activity I have done on my notebook. But, sometimes I forget to transfer from my notebook to registration books things that are very important for monthly report; Most of the time my monthly report is based on my note book." This implies that even if the there is over reported data when registration book is crosschecked with report, It might be true report.

Because here the reported data were the actual data which were on notebook even if not registered on registration book. However, how to reconcile notebook and registration book need to have attention.

In contrary to the above, one of the health extension workers said" In fact, most of the time my monthly report is very low because I report on monthly reporting format only those which are missed on weakly IDSR report as a chance". But these reporting systems are two different reporting systems even though they use the same data. This situation leads to under estimation of cases though high burden of the disease exists in the community.

The observation of data management showed that there were no adequate provisions of registration books for health facilities. Only some health facilities had independent registration books for malaria. Malaria program is expected to have its own independent registration book at health post level so that all necessary data elements could easily be filled. But, if a single registration book is used for many kinds of disease, it creates confusion since different kind of information is required for each disease. Even though there are standardized reporting formats distributed by Oromia regional health bureau,

data filling in health facilities is different from the expectation of the region. Dissimilar data were filled for the same information required due difficulty of understanding what is required on the format.

Even though reporting system of the program is linked to the regional reporting system, the reporting period was not uniformly understood by all health facilities. The deadline of report expected to be reported by health posts is from 1st-4thday on onset of new month. During this days it is expected to be reported those activities which were done from 1-30 days in previous month. Although few health posts were reporting only what they have done from 1-30 days, but, some health posts were reporting by adding those activities they did in reporting period. This dissimilarity of reporting period affects the figure of monthly cases at each level.

7. Strengths and Limitations of the study.

Strengths

The assessment used both quantitative and qualitative study design and factors affecting quality of data were tied to be explored.

Limitations

Time, human and financial constraints limited the scope of this paper to assess data quality of malaria data generated at peripheral health facilities and sent to woreda, zone, region, and national levels. There are also no adequate literatures on the topic.

8. Conclusion.

The study revealed that malaria reporting system in the woreda is being suffered from poor data quality in terms of timeliness, completeness and accuracy dimensions of data quality. Overlapping of training/meetings during reporting time, delaying of time to print out and distribute report format for health facilities due to problem of electricity, work overload, lack of commitment of supervisors to collect and compile reports from Health extension workers and distance of health posts from health centers they are linked to were main factors that affected time of reporting. Data incompleteness was resulted from confusion of some statements written in the report formats, work overload and lack of orientation on reporting formats.

Lack of independent registration book for malaria, problem of forgetting to transfer from notebook on to registration book what has been recorded during home visits, lack of commitment and attention from health professionals to cross check registration book before reporting, data filling by estimation assuming as valueless, and being careless in side of health professionals were major factors that led to poor data accuracy. Though data management system is suffering from several problems, less attention is paid to data quality. Source documents and reporting formats were not given due attention even if they are bases for overall data quality.

Eventually, it can be concluded that if the obtained data with current quality is used for planning, resource allocation and decision making, it could probably mislead decision makers at all level.

9. Recommendations

Based on the findings via the study, the following recommendations are forwarded.

1. The Woreda health office needs to search means by which training/meetings undertaken in the woreda do not overlap with the time of reporting and it also needs to prepare reporting formats in advance as these are mentioned as main factors affecting reporting time.

2.supervisors are always need to cross check registration books, reports and notebooks which Health extension workers use for daily activities. Because sometimes they may forget to transfer from their notebook to registration book all things they have done and which is important for monthly report. Supervisors are also need to have commitment to collect and compile reports especially from Health posts which are far from health centers.

3. The Regional health bureau need to modify some statements on report formats which have the same ideas but on different pages so that the required information can easily be collected with common understanding throughout the region.

4. The Woreda Health office need to provide training independently on data quality focusing on reporting formats, How to handle registration books, reporting period and difference between different reporting system (weekly/monthly) so that uniform report will be reported in the same time period.

5. The woreda health office needs to provide training on HMIS developed by FMOH at health posts too and it needs to be completely implemented.

6. The Woreda health office need to assign Statisticians at health centers so that there will be proper data storage, scientific analysis, interpretations with minimum wastage of resource.

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11.Annexes

Annex A-Verification results

Review availability, completeness, timeliness and accuracy of reports from all service delivery points. How many reports are accurate which are collected from all service delivery points? Are they received on time? Are they complete?

Percentage calculation of all reports that are A) available B) complete

c) On time) accurate

A) % of on time reports=

$$\frac{\text{Number of reports received on time from all service delivery points}}{\text{Number of reports expected from all service delivery points.}}$$

B) % of complete reports (i.e. contains all the relevant data to measure the indicator)

$$\frac{\text{Number of reports that are complete from all service delivery points.}}{\text{Number of reports expected from all service delivery points}}$$

This is to say, for a report to be considered complete, it should at least include 1)the reported count relevant to the indicator,2)the reporting period 3)The date of submission of the report and a signature the person submitted the report.

C) Accuracy ratio=

$$\frac{\text{Number re-counted malaria cases in the health facility Registration during a given time}}{\text{Number of reported malaria cases in the health facility reports found at the district level during the same time period}}$$

Annex B- quantitative data collection tools.

Region _____ Zone _____ woreda_____ Health Facility_____ Date of data collection_____

Table 3-Data collection tools at level health post only the July 2011- December, 2012.

		Malaria morbidity						
Name Health facility	Sources	Confirmed malaria cases						
		July	Aug	Sep	Oct	Nov	Dec	Total
	Recounted number of malaria cases in the HF							
	Reported number of malaria cases by the HF							
	Ratio of recounted to reported							

Data collected by: Name_____

Signature_____

Region_____ Zone_____woreda_____ Health Facility_____ Date of Data collection_____

Table 4-Data collection Table at health centers July 2011-December 2012

Reporting formats	source of information	Malaria seen at health facilty													
		Clinical malaria cases							Confirmed malaria cases						
		July	Aug	Sep	Oct	Nov	Dec	Total	July	Aug	Sep	Oct	Nov	Dec	Total
Monthly malaria morbidity and mortality report	Recounted number of malaria cases in the facility														
	Reported number of malaria cases in the facility														
	Ratio of recounted to reported														
Intergrated disease and surveilance report	Reported number of malaria cases in the facility														
ICDs report	Reported number of malaria cases in the facility														

Data collected by: Name_____

Signature_____

Region_____ Zone_____ woreda_____ Health Facility_____ Date of Data collection_____

Insert the date when reports are received from health facilities at district health office. If reports are received after deadline, put the date in red pen and put “NC” if the report is not complete.

Table 5 - Table for collection of data completeness and timeliness

Health facility name	July	Aug	Sep	Oct	Nov	Dec	total completeness	total timeliness

Data collected by: Name_____
Signature_____

Annex C- Observation checklist for systems assessment.

1. Does the HIS program clearly documented (in writing form) what is reported to who, and and when reporting is required?

_____

2. Are there operational indicator definitions meeting relevant standards and are systematically followed by all service points?

_____

3. Are data recorded with sufficient precision/detail to measure relevant indicators?

---

4. Are there standard data collection and reporting forms systematically used?

_____

5. Are source documents kept and made available in accordance with written policy?

_____

6. Are clear documentation of collection, aggregation, and manipulation steps exist?

_____

7. Are data qualities challenges identified and are mechanisms in place for addressing them?

_____

8. Are there clearly defined and followed procedures to identify and reconcile discrepancies in reports?_____

9. Does the data collection and reporting system of the program link to the regional reporting system? _____

10. Are there clearly defined and followed procedures to periodically verify source data?

_____

Annex D- Consent form

Dear health care workers (participants)!

The aim of this study is to assess routine malaria data quality and its potential factors in Nedjo district, west wellega Zone, Oromia regional state, west Ethiopia, and 2012.This study is primarily designed to assess quality of routine malaria data in terms of completeness, timeliness and accuracy and potential factors to data quality. Result from the study will be used to assist in making recommendations to standardize the malaria reporting system and to initiate continues data quality assessment in the health institutions that will help to improve the HMIS for the production of valuable information to make evidence based decision and proper plan for disease prevention and control.

This study uses quantitative comparison of recounted to reported data, observation of malaria data management and key informant interview. Your district is selected based on the incidence of malaria cases and you are chosen to participate in this study by your position in the district and health facilities. In order to effectively attain the objective of the research, we are requesting your help. There are questions for interview for you and there is no need to put your name on the questionnaire; no Individual responses will be reported. Your answers are completely confidential. It is your full right to refuse, to answer some or all of the questions. If you don't want to leave the interview you can leave the interview at any time. However, your honest response to this interview will help us for better understanding of the malaria data management in the district. So we request you to give your frank responses and dedicated participation. The interview will not take more than 30 minutes to answer.

If you agree to participate in the study we can proceed to the interview.

Yes ☐ No ☐

Annex E - Consent form Afan Oromo Version

(Maxxantuu E- Fuula waliigalteen Hirmaattotaa irratti guutamu).

Kabajamtoota hirmaattota qo’annoo kanaa

Kaayyoon qo’annichaa ijoon Qulqullina ragaa Dhukkuba busaa aanaa Najjoo qorachuu ykn sakatta’uu yoo ta’u calmaatti kan irratti xiyyeeffate qulqullina ragaa dhukkuba busaa gama guutuu ta’uu,yeroon ergamuu fi sirrii ta’uun sakatta’uu fi wantoota qulqullina ragaa dhukkuba busaa kanaan wal-qabatan adda baasuudha.Bu’aan qo’annoo kanaas sirna gabaasa dhukkuba busaa waaltessuu(wal- fakkeessuu) fi dhaabbilee fayyaa keessatti kaka’umsa gamaggama qulqullina ragaa itti fufiinsa qabu uumuudhaan sirna bulchiinsa odeeffannoo fayyaa fooyya’e, murtii faayida qabeessa ragaarratti hundaa’e kennuufi karoora sirrii hojii ittisaa fi to’annoo dhukkuba busaa baasuuf kan gargaaruu dha.

Qo’annoon kun raga duraan gabaafame kan amma irra deebi’uudhaan lakkaa’ame wal bira qabanii madaaluu,bakkatti argamuun akkaataa ragaan busaa ittiin qindeeffamu ilaaluu fi gaaffii fi deebii ogeessota filataman waliin gaggeessuu ta’a.Aanaan keessan kan filatame aanaa baayyinaan dhukkubni busaa keessatti mul’atu waan ta’eef.Isinis kan filatamtan gahee isin ittisa fi to’annoo busaa keessatti qabdan irratti hundaa’eeeti. Haaluma kanaan kaayyoo qo’annoo keenyaa sirriitti galmaan ga’uuf gargaarsa keessan isin gaafanna. gaaffii fi deebii isin gaafannu maqaa keessan kan hin barreeffamne yemmuu ta’u deebiin isin irraa argamu iccitiidhaan kan eegamu ta’uu isaa isiniif mirkaneessina.Walumaa galatti fedhii keessaniin kan hirmaattan yemmuu ta’u yeroo barbaaddanitti gaaffii fi deebii kana addaan kutuuf mirga akka qabdan isin beeksisa.Haata’u iyyuu malee deebii isin amanamummaadhaan nuu deebistan haala qabiinsa ragaa busaa aanichaaf Hubannoo fooyya’aa nuu kenna.Gaaffii fi deebiin keenya daqiiqaa 30 caalaa hin fudhatu.

Qo’annoo kana irratti hirmaachuuf fedhii yoo qabaattan gaaffii fi deebii keenya itti fufuu ni dandeenya.

Eeyyee ☐ Miti ☐

Annex F-semi-structured questionnaire for key informant

This study is to data quality management identify problems related to malaria data quality in our district. The findings will help to design data quality management that will be beneficial to the health system of the region. Thus, are kindly requested to participate in this study by your will. So, please reply what you know for the following interview questions. It is confidential that any of these responses will be transferred to other party. Thank you for your cooperation and participation on this research.

Date of interview_____

Name of the health facilities (institution)_____

Position of the respondent_____

Profession _____

Year of experience_____

Area of responsibility related to malaria _____

I. Data collection tools

1. From where do you get the reporting format and register books? _____
2. Do you know national indicators related to malaria? _____
3. Do you know and collect essential data elements that are important to measure indicators for malaria program?_____ _____
4. Are data collection tools are easy and suitable to collect all data elements?_____

II. Time for reporting

5. When is the deadline to aggregate and send the Report to the next level_____

6. What do you think will happen if you don't timely report your work?_____

7.. What are the problems related to time of reporting?_____

_____

8. What do you think could be possible solutions? _____

_____

III. Information Flow within the facility and to the upper level

9. Do you have a regular meeting within the team or with peers on monthly compiled data?_____

10. What do you think the importance of reports you send to upper level?

_____

11. Why do you think problem of over reporting/ under reporting occurs

_____

12. What do you think could be possible solutions? _____

_____

IV. Supervision and feed back

13. What do you do to ensure data quality during supervision?_____

_____

14. Are source documents are reviewed during supervision to improve the completeness and accuracy reported data?_____

_____

15. Do you get feedback from the upper level on the reports you send up?

_____

_____

V. Training

16. Do you get proper orientation /skill on HMIS procedures and formats?

_____

_____

17. What kind of training do you think will improve quality of data management?_____

VII. Use Information

18. What are the problems associated with reporting and use of the information?

_____

_____

19. What do you think could be possible solutions for these problems?_____

_____

20. What is your final suggestion concerning routine malaria data quality?

_____

_____

Annex G-semi-structured questionnaire for key informant Afan Oromoo version

Maxxantuu G-Gaaffii namoota murteessoo ta’aniif qophaa’e

Qo’annoonnoon kun rakkoowwan qulqullina qabiinsa ragaa busaa aanaa keenya keessa jiru adda baafachuuf kan qophaa’eedha.Bu’aan qorannoo kana irra argamu haala qabiinsa raga busaa naannoo keenya jiruuf b’aa guddaa gumaachuu ni danda’a.Haaluma kanaan fedhii keessaniin qo’annoo kana irratti akka hirmaattan afeerra.Gaaffii armaan gadiitti isiniif dhiyaatuuf deebii akka nuuf laattan yemmuu isin gaafannu deebii isin irraa argamu iccitiidhaan kan eegamu ta’uu isaa isiniif mirkaneessa.Tumsaa fi hirmaannaa nuuf gootaniif dursinee isin galateeffanna.

Guyyaa gaafii fi deebiin itti gaggeeffame_____

Maqaa dhaabbata fayyaa_____

Itti gaafatamummaa nama deebii kennee_____

Ogummaa barumsaa nama deebii kennee_____

Muuxannoo waggaa isaan qaban_____

Gahee isaan ittisaa fi to’annoo busaa irratti qaban_____

I.Meeshaalee ragaan fayyaa ittiin sassaabaman

1. Baca gabaasaa fi galmee irratti galmeesitan eessaa argattu?_____
_____

2.Agarsiistuu busaa sadarkaa biyyoolessaatti jiru beektuu?_____

_____

3..Odeeffanoo ragaa agarsiistuu kana safaruuf gargaaru beektuu?_____
_____

4. Bocni gabaasi itti ergamuu fi qabiyyee isaa guutamuu qaban hundi sirriitti hubatanii guutuuf mijaawaa dha?_____

_____

II.Guyyaa Gabaasni itti ergamu

5. Guyyaa dhumaa gabaasa walitti qindeessitanii qaama olaanutti ergitan yoomi?

_____

6. Hojii keessan yeroon hin gabaastan yoo ta'e maaltu ta'a jettanii yaadu?

_____

7. Rakkoowwan yeroo gabaasaa wajjin wal qabatan maal fa'i? _____

8. Maalyu furmaata ta'a jettanii yaaddu?_____

III.Odeeffannoo sadarkaa dhaabbilee fayyaa fi olaanu wajjin waljijjiiruu

9. Ragaa ji'aan walitti qabame irratti sagantaa idilee baafachuun hojjettoota garee keessanii wajjin ni maari'atttuu ?

10.Gabaasa isin ol ergitan faayidaan isaa maal jettanii yaaddu?_____

11. Gabaasni maaliif kan gabaafamuu qabuu olitti/gaditti gabaafama jettanii yaaddu?_____

12.Maaltu furmaata ta'a jettanii yaaddu?_____

IV.To'annoo fi duub-deebii

13. Yeroo to'annaa qulqullina raga mirkaneessuuf maalfaa gootu?_____

14.Gabaasni gabaafamu guutuu fi sirrii akka ta'uuf,yeroo to'annoo meeshaaleen itti ragaa sassaaban ni sakatta'amuu?_____

15.Qaama olaanu irraa gabaasa gabaastaniif duub-deebii ni argattuu?_____

V.leenjii

16.Tartiiba qaboo ragaa fi boca gabaasaa irratti qabaachisa ykn dandeettii gahaa argattanii jirtuu?_____

17. Leenjii akkamiitu qulqullina qabiinsa raga fooyyessu danda'a jettanii yaaddu?_____

VI.Itti Fayyadama odeeffannoo

18. Rakkoowwan gabaasaa fi itti fayyadama odeeffannoon wal-qabatan maal faadha jettee yaadda?_____

19. Rakkoowwan armaan olitti ka'amaniif furmaati maali jettanii yaadu?_____

20. Yaadi xumuraa qulqullina ragaa busaa ilaalchisee qabdan maali?_____

Annex I- Information Sheet to get Permission for the Research

Introduction

This information sheet is prepared to explain the research project that you are asked to join by a group of research investigators. The main aim of this research project is to assess routine malaria data quality and its potential factors. The research team includes a final year MPH graduate student and two senior advisors from university of Gondar, school of public health, college of medicine and health sciences.

Name of Principal Investigator: Serbesa Dereje.

Name of Advisors: 1. Mr. Kassuhun Alemu(BSc,MPH)

2. DR. Belayenew Wassie(MD,MPH)

Name of the Sponsor**: University of Gondar**

Name of Organization: **University of Gondar, College of Medicine and Health Sciences, School of Public Health:**

This information sheet is prepared by above mentioned researcher whose main aim is "Assessment of routine malaria data quality and potential factors in Nedjo district,west wellega zone,oromia regional state,west Ethiopia,2012"

The investigator is a final year MPH student with advisors from school of public health, college of medicine and health sciences, University of Gondar.

Purpose:

The purpose of this research study is "assessment of routine malaria data quality and its potential factors" in Nedjo woreda t,west wellega zone,oromia regional state,west Ethiopia,2012 "

This study is primarily designed to verify quality of routine malaria data in terms of completeness, timeliness and accuracy and potential factors to malaria data quality. Result from the study will be used to assist in making recommendations to standardize the malaria reporting system and to initiate continues data quality assessment in the health institutions that will help to improve the HMIS for the production of valuable information to make evidence based decision and proper plan for disease prevention and control.

Procedure:

The study uses Institutional based crossectional study triangulated by qualitative study design, through semi-structured interviews with key informants, observation and review of existing documents. Permission will be processed from the University of Gondar, Oromia regional health Bureau,west wellega zonal health department and Nedjo district health office.

Risk and/or Discomfort:

There is no any risk or discomfort that the respondents will face by participating in this research except dedication of their time for responding the interview and document review. Any personal information registered in registration books will not be copied and transferred to other bodies. Every piece of information will be kept confidentially.

There will be no risk in participating in this research project.

Benefits:

There will be direct benefit for the district and health facilities participating in this research. The findings of the study will be very important to appreciate the discrepancies among the different monthly reporting formats of routine malaria data, to standardize the malaria reporting system and to improve the HMIS for the production of valuable information to make evidence based decision and proper plan for disease prevention and control.

Incentives/Payment for Participating:

There is no incentive or payment to be gained by taking part in this project.

Confidentiality:

All Personal identifiers & personal information will not be taken. The information collected from this research project will be kept confidential. Information will be accessed by the researcher and research assistant only.

Persons to contact:

This research project will be reviewed and approved by the ethical committee of the University of Gondar. For further information, you can contact the following individuals(The researcher and Advisors).

Investigator:Serbesa Dereje: E-mail Serbesa.dereje @yahoo.com

Mobile no: 09 13 34 28 52

Advisors: 1. Mr. Kassahun Alemu:Alemukass@yahoo.com

Kassalemu@gmail.com

P.O .Box.196

2. Dr.Belayenew Wassie: bewassie@yahoo.com

Mobile no: 09 13 47 43 98

P.O. Box: 196

Declaration

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health.

Name _____

Signature_____

Place of submission: Institute of Public Health, Collage of Medicine and Health Sciences, University of Gondar.

Date of Submission: _____

This thesis work has been submitted for examination with my /our approval as university advisors:

	Name	**signature**
1.	_____	_____
2.	_____	_____